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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,579	03/11/2004	Eun-sung Lee	Q80074	4816

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EXAMINER

TADESSE, YEWEBDAR T

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/797,579

Applicant(s)

LEE ET AL.

Examiner

Yewebdar T. Tadesse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-2, 6-7 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-7 and 9-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Konishi et al (US 6,012,858).

With respect to claim 2, Konishi discloses (see Figs 6 and 8) a spin coating apparatus for coating photoresist, comprising: a spin chuck (chuck 2 with tray 30) comprising a mount part (see holder 10 and flange 33), for mounting a wafer thereon, and an extended projection part (portion 32) for facilitating formation of an edge-bead thereon; and a nozzle (40) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck; wherein the extended projection part of the spin chuck is capable of having a height lower than of the wafer mounted on the mount part (see column 6, lines 9-10).

Regarding claims 1 and 10, in Konishi the extended projection part (32) of the spin chuck surrounds the entire circumference of the wafer (see Fig 8) while being in contact with the circumference of the wafer mounted on the mount part.

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As to claim 9, in Konishi (see Fig 3) the extended projection part of the spin chuck is physically attached to the mount part (flange 33) of the spin chuck.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-2 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al (US 5,294,257) in view of Chu (US 5,857,127).

As to claims 1-2 and 10, Kelly discloses (see Figs 1A and 3B and column 3, lines 19) a spin coating apparatus for coating photoresist, comprising: a spin chuck (13) comprising a mount part (part of item 13), for mounting a wafer thereon, and an extended projection part (a firm elastomeric ring 17, 41) for facilitating formation of an edge-bead thereon; wherein the extended projection part of the spin chuck surrounds the entire circumference of the wafer (see Fig 1A) while be in contact with the

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circumference of the wafer mounted on the mount part and wherein the extended projection part of the spin chuck is capable of having a height lower than of the wafer mounted on the mount part (depending the thickness of the substrate and the elasticity of the ring 17, 41). Kelly lacks teaching a nozzle for depositing photoresist, although application of resist in conventional manner is taught in Kelly (see column 5, lines 65-66). Chu discloses a nozzle (15) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Kelly et al to apply the coating material onto the substrate.

As to claim 9, in Kelly et al (see Fig 1A) the extended projection part of the spin chuck is physically attached to the mount part of the spin chuck (corrected a typographic error to the name of Kelly et al typed as Pancham on the NF action sent on 07/07/06).

6. Claims 6-7 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al (US 6,012,858) as applied to claim 1 above and further in view of Emami et al (US 2003/0070695).

Konishi et al are cited for the same reasons described above (re claim 7). However, Konishi lacks teaching a gas exhaust disposed so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. Emami discloses (see Fig 4) a gas exhaust disposed above the wafer so that gas is exhausted from an edge of the wafer in turning direction of the

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wafer and a centrifugal direction upon rotation of the wafer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a gas exhaust as claimed in Chu or Konishi et al to remove the edge bead (see Abstract).

7. Claims 6-7 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al (US 5,294,257) in view of Chu (US 5,857,127) as applied to claim 1 and further in view of Emami et al (US 2003/0070695).

Kelly et al is cited for the same reasons described above (re claim 7). However, Kelly et al lacks teaching a nozzle for depositing photoresist and a gas exhaust disposed so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. Emami discloses (see Fig 4) a gas exhaust disposed above the wafer so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a gas exhaust as claimed in Kelly et al to remove the edge bead (see Abstract). As to a nozzle, Chu discloses a nozzle (15) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Kelly et al to apply the coating material onto the substrate.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al (US 5,294,257) in view of Chu (US 5,857,127) and Emami et al (US 2003/0070695).

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Kelly is cited for the same reasons described above (see paragraph 3 above). Kelly lacks teaching a nozzle for depositing photoresist and a separation means comprising removable plugs. Kelly discloses (see column 3, lines 55-61) a removable supply lines (having holes) provided on the chuck as separating means (to inflate and deflate the elastomer ring). Emami et al discloses (see Fig 3 and paragraph 28) a separation part comprising removable lift pins disposed on a lift ring. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include removable lift pin in Kelly to inflate/deflate the ring so as to separate the wafer from the chuck or seal the wafer on the chuck. As to a nozzle, Chu discloses a nozzle (15) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Kelly et al to apply the coating material onto the substrate.

Response to Arguments

9. Applicant's arguments filed 09/22/2006 have been fully considered but they are not fully persuasive. Examiner maintains the 102 and 103 rejection over Konishi and Kelly alone and/or in view of others for the following reasons: Applicants argue (see Remarks, pages 7-8, under heading Independent claim 2) that Konishi does not disclose a spin coating apparatus and the apparatus mounts and coats developing solution not "photoresist". First, Konishi discloses a spin coating apparatus (see column 5, lines 41-43 and Fig 6 developing unit having a spin chuck (2)). In response to

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applicant's argument that Konishi coats developing solutions not photoresist, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Konishi the nozzle (40) is capable depositing a photoresist onto a wafer. If the prior art structure is capable of performing the intended use, then it meets the claim.

With respect to the argument (see Remarks, page 8, under heading claim 2) that combination of Kelly et al and Chu does not disclose a spin coating apparatus, Examiner respectfully disagrees because Kelly et al discloses a spin coating apparatus (see Kelly et al column 5, lines 38-41).

As to the argument (see Remarks pages 9-10) that in Kelly et al the edge bead is not formed on the elastomer 17. This argument is not persuasive. The argument is not commensurate in scope with the claims. The claims are not limited to the formation of edge bead on an extended projection part. Kelly et al's extended part (17 and 41) facilitate the formation of edge bead as claimed. Additionally, referring to Figs 3A and 3B of Kelly, applicants argue that an edge seal is provided with a vacuum forcing into the elastomer 41 and this seal prevents the photoresist from being coated on the edge of the substrate. Examiner respectfully disagrees because Kelly et al's parts (41) are capable of facilitating the formation of edge beads depending the thickness of the wafer treated. Furthermore, In Kelly the elastomer (41) is capable of being lower than the wafer of the substrate depending the thickness of the substrate treated.

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Examiner presents same arguments as described above for independent claims 7 and 11.

Claims 1, 6, 9-10 and 12 depends on claim 2 and claim 13 depends on claim 7, and thus rejectable over the cited references for the same reasons discussed above with respect to claims 1 and 7.

As such the examiner maintains the rejections over Konishi and Kelly et al alone and/or in combination with Chu and Emami for the reasons described above.

Applicant's arguments, Remarks, page 6; with respect to claim 2 have been fully considered and are persuasive. The 102 rejection of Chu has been withdrawn.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM-4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


YTT